

Weekly report

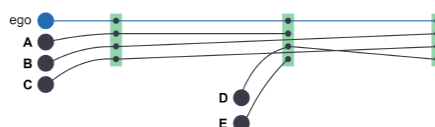
1 Done

1.1 Reading

1.1.1 A Survey of Privacy-preservation of Graphs and Social Networks (Xintao Wu)

- Disclosure:
 - The **identity disclosure** corresponds to the scenario where the identity of an individual who is associated with a node is revealed.
 - The **link disclosure** corresponds to the scenario where the sensitive relationship between two individuals is disclosed.
 - The **attribute disclosure** denotes the sensitive data associated with each node is compromised.
- Background Knowledge:
 - All: attributes of vertices, specific link relationships between some target individuals, vertex degrees, neighborhoods of some target individuals, embedded subgraphs, and graph metrics (e.g., betweenness, closeness, centrality)
 - Unlabeled: structural background knowledge in their attacks (e.g., vertex degrees, neighborhoods, embedded subgraphs, graph metrics)
- Utility:
 - **Graph topological properties.**
 - **Graph spectral properties** (the set of eigenvalues of the graph's adjacency matrix or other derived matrices).
 - **Aggregate network queries.**
- Anonymization Approaches
 - **K-anonymity**: edge deletions and additions → K-1 structural patterns.
 - K-degree anonymity.
 - K-Neighborhood anonymity.
 - K-automorphism anonymity (subgraph).
 - **Edge randomization**: modifies graph structure randomly.
 - Rand add/delete.
 - Rand switch.
 - Feature preserving randomization.
 - **Cluster-based generalization**: cluster nodes or edges → anonymize a subgraph into a super-node with super-edges.

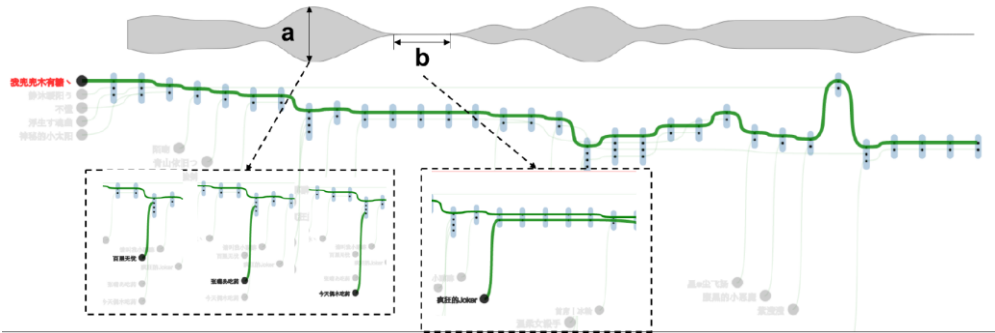
1.1.2 A Visual Analytics Approach for Understanding Egocentric Intimacy Network Evolution and Impact Propagation in MMORPGs (Huamin Qu)



This paper provides a new design to visualize dynamic ego network, as shown in the figure above. They calculate the coordinate of each node though:

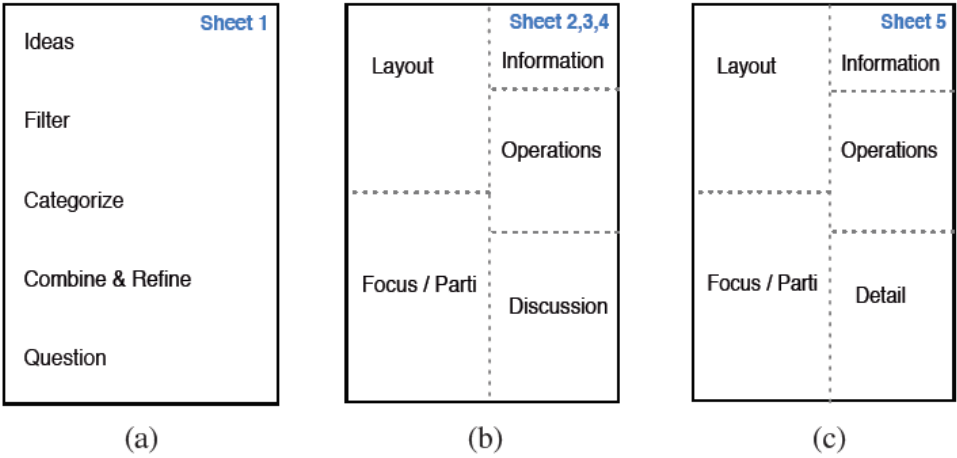
$$Y(s_i) = \frac{\sum tempY(n_j)}{3} - \frac{H(S_i)}{2},$$

As a result, the offset of the node can indicate the change of ego network to some extent. Furthermore, they employ flow chart to emphasize the exact change of ego chart, as shown as follow.



1.1.3 **Sketching designs using the Five Design-Sheet methodology** (Panagiotis D. Ritsos)

They present the Five Design Sheet (FdS) methodology, which enables users to create information visualization interfaces through lo-fidelity methods.



The FdS sheets: (a) Sheet 1: Generate Ideas, filter, categorize, combine & refine then question. (b) Sheets 2,3,4 with the five sections in the 2-row 3- row format; (c) Sheet 5, the realization sheet where detail is included instead of Discussion.

- 1.2 Modify the draft of monograph.
- 1.3 Polish our submission. After discussing with Jia-Kai, we decide to mainly improve the evaluation. First of all, we check two new datasets, which are more sensitive. The dataset about loan has enough attributes for us to explore, however, another dataset about mental illness is lack of enough information.